



December 1, 1993

Ms. Deborah Robinson
U.S. Environmental Protection Agency, Region 10
1200 Sixth Avenue, Mail Stop HW-114
Seattle, Washington 98101

**SUBJECT: Preliminary Assessment Recommendations
Van Waters and Rogers, Inc., Site (IDD984670067)
Boise, Idaho
Contract 068-W9-0009
Work Assignment C1004720**

Dear Ms. Robinson:

PRC Environmental Management, Inc. (PRC) has completed a preliminary assessment (PA) of the Van Waters and Rogers, Inc. (VWR) site in Boise, Idaho, under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act (SARA).

The PA was conducted to assess the immediate and potential threats that wastes at the site pose to human health and the environment, and to collect information to support a decision regarding the need for further action under CERCLA/SARA.

SUMMARY

The site was the location of a warehouse where VWR stored and distributed chemical products. An aboveground storage tank held perchloroethylene (PCE), which was spilled during distribution. The warehouse was removed from the site in 1987 or 1988, and the PCE storage tank was removed sometime before 1990. A Pier I Imports, Inc. store and a paved parking lot now cover the area where the warehouse and PCE storage tank were located.

PCE spills have contaminated the soil at the former VWR site and in the site vicinity. Based on analyses of groundwater and surface water samples, the shallow and deep aquifers are contaminated with PCE and PCE-breakdown compounds; South Slough is also contaminated with PCE.

The primary threats to humans and the environment from the PCE-contaminated soil appear to be via groundwater migration to the shallow and deep aquifers, which are used for drinking water. There are three Idaho Department of Health and Welfare (IDHW) orders for mitigation of the soil and groundwater contamination at and downgradient of the former VWR site. An additional IDHW order with VWR includes a requirement for providing an alternative water supply to those residences and businesses with PCE-contaminated well water downgradient of the site.

USEPA SF



1415737

Deborah Robinson
December 1, 1993
Page 2

There are no direct soil or air exposure hazards at the VWR site because the asphalt-paved parking lot covers the contaminated soil. The asphalt appeared to be in excellent condition during the August 27, 1993, preliminary assessment. Because of the asphalt, the contaminated soil is inaccessible to the public, infiltration of surface water through the contaminated soil is restricted, overland flow has no influence on the contaminated soil, and gas and particulate releases to air are unlikely.

RECOMMENDATIONS

A June 1992 memorandum of agreement between the U.S. Environmental Protection Agency (CERCLA) and the Idaho Division of Environmental Quality (IDEQ), IDHW, defines IDEQ as the lead agency for the VWR site. IDHW orders are addressing mitigation of soil, groundwater, and surface water contaminated with PCE and PCE-breakdown compounds attributed to the VWR site. Therefore, no further action by the Superfund program is recommended, except for continuing oversight of IDHW enforcement and site mitigation activities. Also, if the asphalt-paved parking lot is altered or removed in the future, the impacts to groundwater, surface water, and air by PCE migration from the contaminated soil should be re-evaluated under HRS.

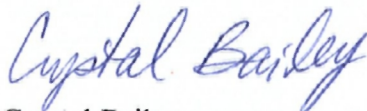
Contacts for the VWR site are:

Michael Gaudette, Site Representative
Van Waters and Rogers, Inc.
2723 S. Cole Road
Boise, Idaho 83709
(208) 362-6545

Rob Howarth
Idaho Division of Environmental Quality
1420 North Hilton
Boise, Idaho 83706-1260
(208) 334-0550

Please contact me or Jerry Shuster at (206) 624-2692 if you have any questions regarding this PA.

Sincerely,



Crystal Bailey
Site Manager

**VAN WATERS AND ROGERS, INC.
BOISE, IDAHO
(IDD984670067)**

**PRELIMINARY ASSESSMENT
FINAL REPORT**

Prepared for

**U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Waste Programs Enforcement
Washington, D.C. 20460**

Work Assignment No.	: C10047
EPA Region	: 10
Date Prepared	: December 1, 1993
Contract No.	: 068-W9-0009
Prepared by	: PRC Environmental Management, Inc.
PRC Project Manager	: Jerry Shuster
PRC Site Manager	: Crystal Bailey
Telephone No.	: 206/624-2692
EPA Work Assignment Manager	: Gary Sink
Telephone No.	: 206/553-4687

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1.0 INTRODUCTION	1
2.0 SITE BACKGROUND	1
2.1 LOCATION	2
2.2 OPERATIONAL HISTORY AND WASTE CHARACTERISTICS	2
2.3 REGULATORY ACTIVITIES	5
3.0 PATHWAYS AND ENVIRONMENTAL HAZARD ASSESSMENT	9
3.1 GROUNDWATER	10
3.2 SURFACE WATER	12
3.3 SOIL	14
3.4 AIR	15
4.0 SUMMARY AND CONCLUSION	16
5.0 REFERENCES	18

APPENDIX

A PHOTOGRAPH LOG

LIST OF TABLES

1	SOIL BORING ANALYTICAL DATA FOR JUNE 1989	14
---	---	----

LIST OF FIGURES

1	SITE LOCATION	3
2	SITE DETAIL	4
3	AFFECTED AREA BOUNDARY	8

1.0 INTRODUCTION

PRC Environmental Management, Inc. (PRC) was requested to conduct a preliminary assessment (PA) of the Van Waters and Rogers, Inc. (VWR) site in Boise, Idaho, by the U.S. Environmental Protection Agency (EPA) under contract 068-W9-0009, work assignment C10047. The PA was conducted under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA).

The PA was conducted to assess the immediate and potential threats that wastes at the site pose to human health and the environment, and to collect information to support a decision regarding the need for further action under the CERCLA/SARA program.

Specifically, the objectives of the PA were to:

- Identify any potential emergency that may require an immediate response
- Document the presence or absence of uncontained or uncontrolled hazardous substances on site and the potential for off-site migration
- Identify site characteristics and collect area receptor information

This report documents the findings of the PA at the VWR site. PRC collected and reviewed information from the EPA; the Idaho Department of Health and Welfare (IDHW), Idaho Division of Environmental Quality (IDEQ); the Idaho Division of Water Resources; the Boise Water Corporation; and VWR. PRC staff inspected the VWR site on August 27, 1993. The inspection included interviews with an IDEQ representative and a VWR site representative, and a walk-through of the site.

2.0 SITE BACKGROUND

This section contains information about the site location, operational history, regulatory activities, and waste characteristics.

2.1

LOCATION

The VWR site is in southwest Boise, Idaho, at latitude 43°36'30" north and longitude 116°16'30" west, on property currently owned and operated by Pier I Imports (photograph 1). The current address of Pier I Imports is 140 N. Milwaukee Street. The VWR site was located on Friendly Drive, which no longer exists because of the construction of the Pier I Imports store and a mall. Figure 1 shows the site location.

The VWR site is in a residential and commercial area. To the north, the mall (Boise Towne Square Mall) is approximately 550 feet from the site (Figure 2 and photograph 2). To the east, Interstate 184 parallels the parking lot and runs northeast-southwest. South of the site the Union Pacific Railroad borders the parking lot and runs east-west. A movie theater and several small businesses occupy the property west of the site; Milwaukee Street runs north-south to the west of these businesses. (b) (6)

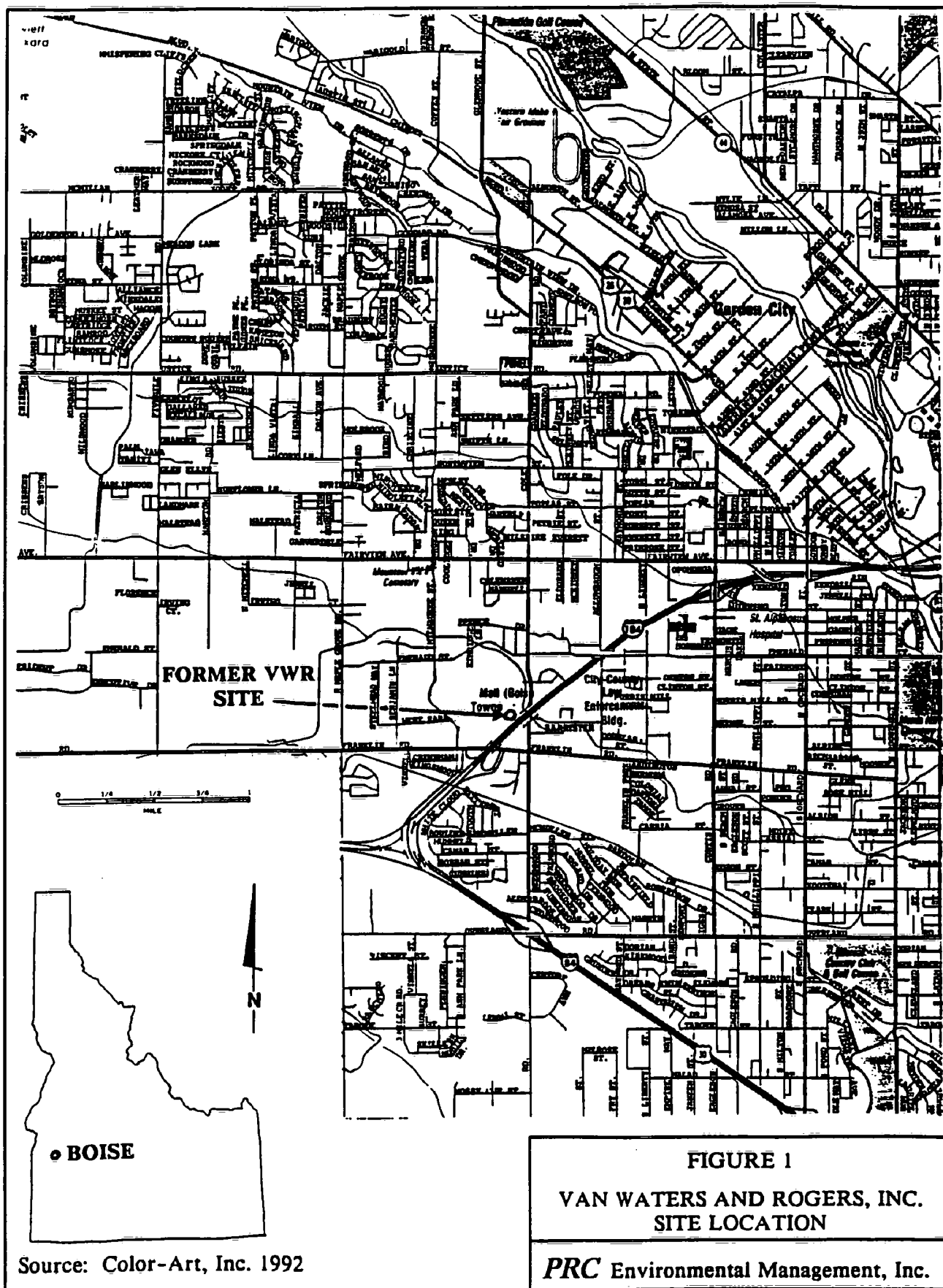
The Westpark Mall, which is west of this residence (photograph 3), is where PCE contamination associated with the VWR site was first encountered (see Figure 2).

The site is in an area that is generally flat. Before construction of the Pier I Imports store and the Boise Towne Square Mall, the site area was generally flat and sloped gently toward the northwest. The head of South Slough is northwest of the VWR site, and the Ridenbaugh Canal runs east, north, and west of the site (see Figure 2).

2.2

OPERATIONAL HISTORY AND WASTE CHARACTERISTICS

From 1973 to 1981, VWR, a subsidiary of Univar, operated a chemical distribution facility from a warehouse that was also occupied by Nielsen Transfer and Storage Company during the same period. When the business was purchased by Air Van North American (AVNA) in 1981, AVNA operated on the property, but Nielsen Transfer and Storage Company maintained ownership of the building and land. AVNA used the portion of the warehouse not occupied by VWR for storage of household goods from 1981 to 1987 (PRC 1993). The property and warehouse were sold to the Boise Mall Development Company in April 1987 (GZA 1991). Ownership of the land at 140 Milwaukee Avenue was transferred from Boise Mall Development Company to Pier I Imports, Inc. in February 1989 (IDHW 1992a).



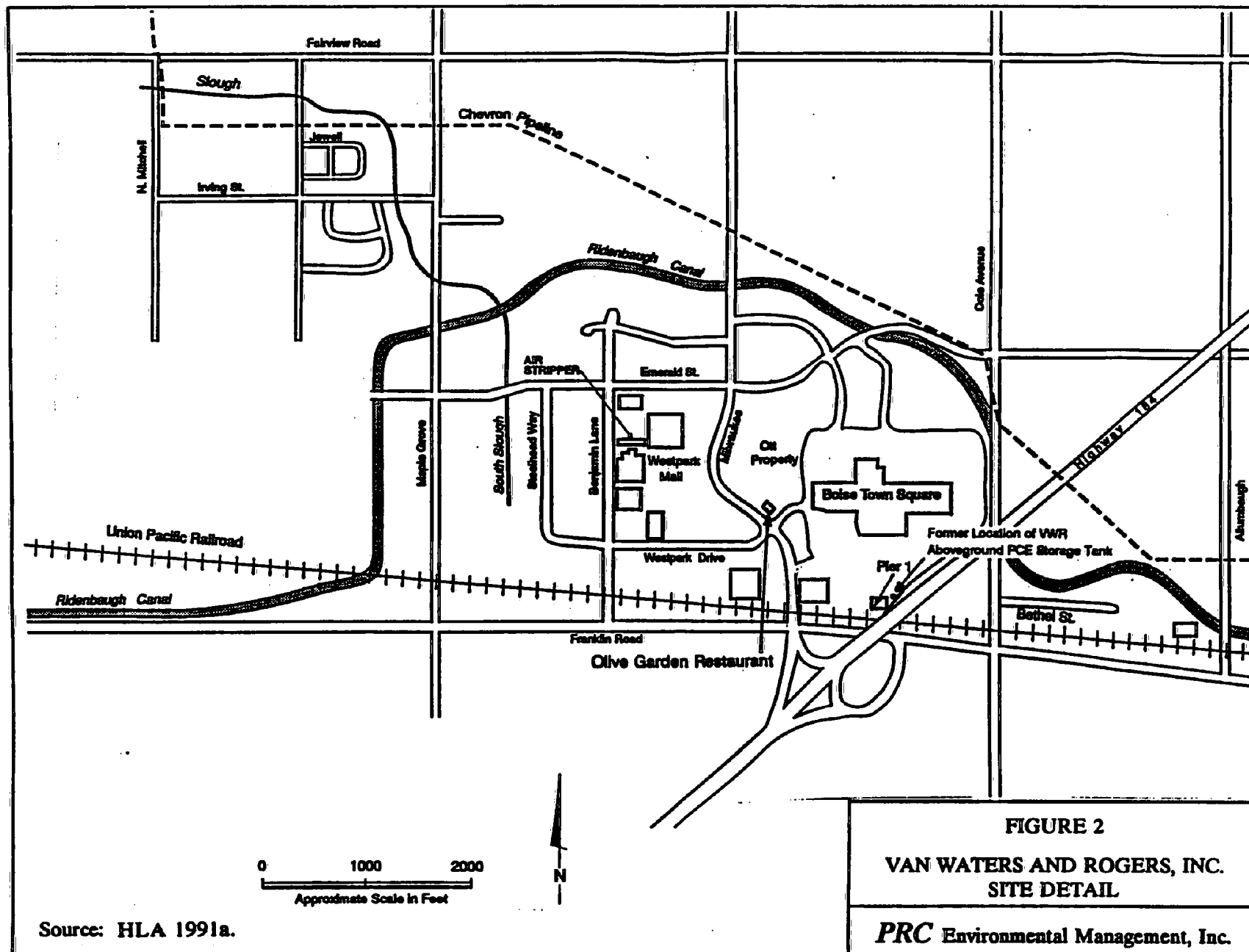


FIGURE 2
VAN WATERS AND ROGERS, INC.
SITE DETAIL

PRC Environmental Management, Inc.

VWR reportedly stored perchloroethylene (PCE) in a 6,000-gallon aboveground storage tank outside and east of the warehouse. The storage tank was reportedly filled via railroad cars that traversed the southern portion of the property that the warehouse occupied (GZA 1991). In 1987 or 1988, the warehouse was removed, but it is not known when the PCE storage tank was removed; it was before 1990, however, according to an aerial photograph. In addition to PCE, VWR stored other chemicals at the site. However, the PCE spill is the only documented release; no chemicals, other than those associated with the PCE spill, have been identified in environmental samples.

The former location of the tank is now covered and surrounded by an asphalt-paved parking lot that serves the Pier I Imports store and the Boise Towne Square Mall. The former location of the warehouse is now occupied by the Pier I Imports store (Harding Lawson Associates [HLA] 1991a). Therefore, the VWR facility itself no longer exists, and was not observed during the preliminary assessment on August 27, 1993.

Based on historical information, PCE was spilled from 1973 to 1981 during distribution from the aboveground storage tank. The amount spilled is unknown. PCE and PCE-breakdown compounds have been found in the soil of the former tank area and vicinity. Based on soil samples (HLA 1991a), the contamination extends to at least 14 feet below ground surface and covers an area of approximately 1,000 feet by 450 feet.

2.3 REGULATORY ACTIVITIES

There are three IDHW consent orders that require investigations of the environmental media contaminated with PCE that is associated with the VWR site. This section describes the geographical areas covered by the orders and briefly describes the requirements of each order. An EPA site visit is also summarized.

Effective January 16, 1989, IDEQ entered into a consent order (IDHW 1989) with Westpark Partnership; this is referred to as the Westpark order. On February 15, 1989, the obligations of Westpark Partnership set forth in the Westpark order were assumed by Walla Walla Shopping Center Associates, a California limited partnership. The Westpark Mall property is west of the Boise Towne Square Mall (b) (6) Westpark Partnership wanted to purchase and develop this property for commercial purposes. While preparing for development of the property, Special Resource Management, Inc. (SRM) was hired to investigate

the environmental condition of the property. After the discovery of PCE in groundwater (with the highest concentrations found in the center of the plume, ranging from 1,000 to 2,500 micrograms/liter [$\mu\text{g/L}$]), SRM prepared a report (SRM 1987) describing the nature and extent of this contamination. Westpark Partnership then notified IDEQ of the contamination and provided them a copy of the report. IDEQ then notified EPA Superfund program representatives in Boise of the problem.

After consultation with IDEQ and preparation of an additional site characterization plan, SRM prepared a remediation plan (SRM 1989) for the PCE-contaminated groundwater underlying the Westpark property. Westpark Partnership stated its willingness to implement the remediation plan, provided they could continue development of the property. The Westpark order states that Westpark Partnership is to implement the remedial measures so that the levels of PCE in groundwater under the property are reduced to less than or equal to 10 $\mu\text{g/L}$. Groundwater remediation at the Westpark property began in March 1990. Treated groundwater is discharged to South Slough; Westpark Partnership applied for a National Pollutant Discharge Elimination System permit for this discharge in November 1993 (EPA 1993a).

A consent order (IDHW 1992b), referred to as the water supply order, was signed by VWR and IDHW on January 3, 1992. This order was determined to be necessary based on PCE found in groundwater in the vicinity of the Boise Towne Square Mall, and in 1990 by IDEQ in private wells north and west of this mall. This order requires elimination of the use of water supply wells that are affected by PCE and determination of the need for developing and implementing a procedure to provide an alternative water supply option for households and other groundwater users in an area generally downgradient (northwest) of the Boise Towne Square Mall.

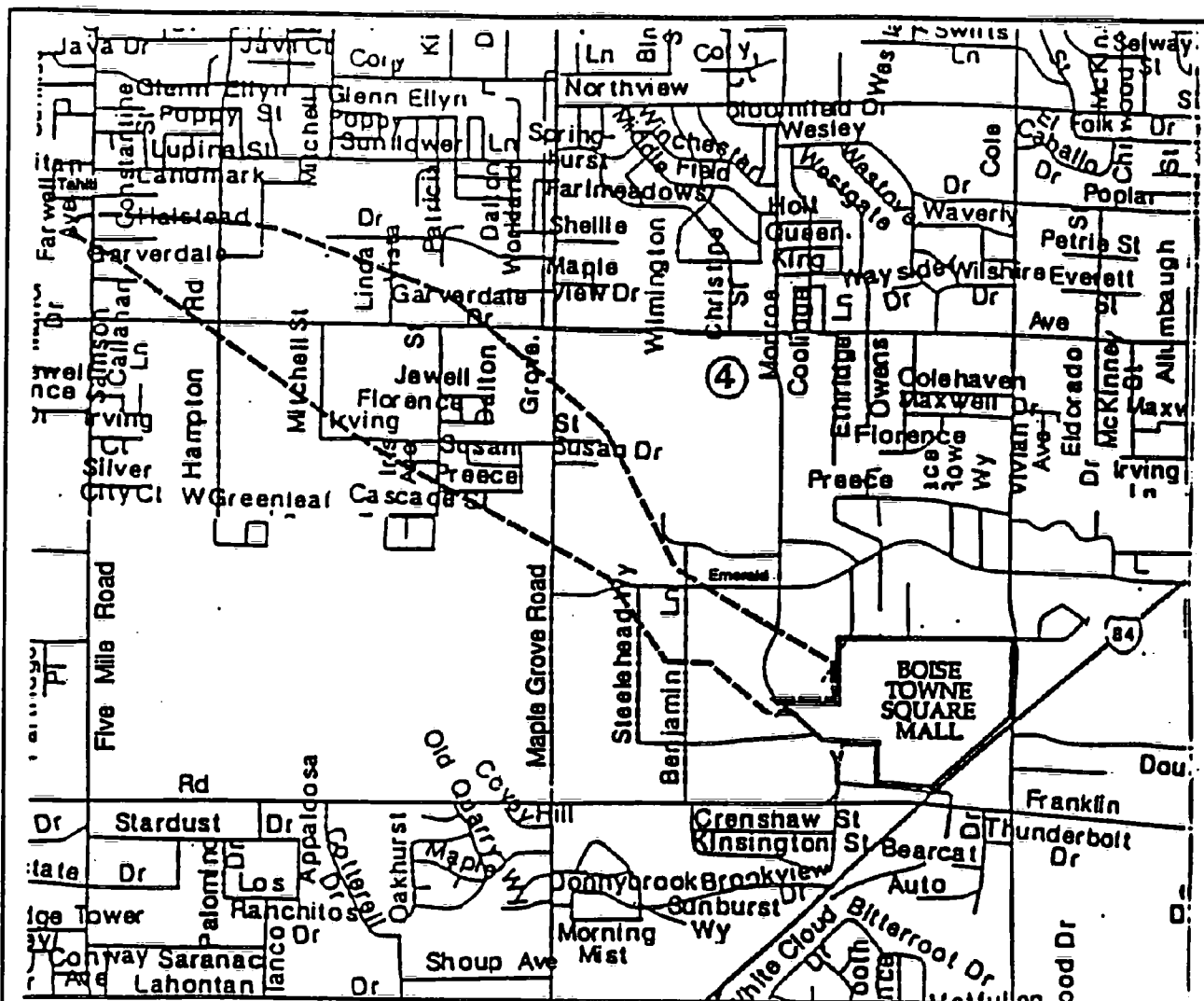
Samples collected from some private drinking water wells in the vicinity of Maple Grove Road and Fairview Road (west and north of the Boise Towne Square Mall, respectively; see Figure 1) by IDEQ in 1990 showed the presence of PCE and PCE-breakdown compounds at concentrations exceeding maximum contaminant levels. To address the potential long-term health concerns resulting from the use of water containing PCE, IDEQ, working pursuant to an action plan developed in cooperation with EPA Superfund program representatives in Boise, requested the provision of alternative sources to those using water from affected wells. VWR submitted a water supply plan to IDEQ, which is attached to the water supply order (IDHW 1992b). This water supply plan describes the activities necessary for determining the need for, and development and implementation of alternative water supplies (including but not limited to making connections to

existing alternative sources) to households and other groundwater users in the area downgradient (northwest) of the Boise Towne Square Mall (IDHW 1992b). This area is referred to as the preliminary affected area, and is defined by groundwater quality data collected by IDEQ prior to issuance of the water supply order. VWR is required by the water supply plan to identify the properties with wells within the preliminary affected area by sampling the groundwater from these wells to determine whether PCE and PCE-breakdown compounds are present. Once all wells that contain PCE compounds are identified, the area is then referred to as the affected area. In March 1993, VWR submitted a letter to IDHW defining the affected area (see Figure 3). As of October 1993, 82 residences and businesses with wells that contain PCE-contaminated groundwater have been provided an alternative water supply source (IDEQ 1993).


On September 24, 1992, VWR signed a consent order (IDHW 1992a) with IDHW for investigation, implementation of interim remedial measures, and evaluation of the need for and selection of remedial activities within the preliminary study area (PSA). The PSA is an area that is generally downgradient of the Boise Towne Square Mall, generally coincident with the preliminary affected area, and generally bordered by Five Mile and Hampton Roads to the west, Sunflower Lane to the northwest, and the area between Emerald Street and the Union Pacific Railroad to the South (see Figure 1) (HLA 1992a). The PSA order states that the definition of the PSA may be changed as the boundaries of the preliminary affected area become defined as the affected area, or as a result of the investigation conducted pursuant to the PSA order.


The PSA order states that a PSA investigation work plan was submitted in September 1992, and was approved by the IDHW. If investigations reveal source locations or suspected source locations in the PSA, and if it is determined by VWR that an interim remedial measure would be appropriate to prevent the spread of PCE contamination or if there is an imminent threat to human health and the environment, interim remedial measures may be necessary. Also, if the IDHW determines after reviewing investigation reports that remedial action is warranted, VWR must submit a remedial action plan for PCE cleanup in the PSA. Since it has been determined that remedial efforts in the PSA are necessary, VWR is currently searching for available property on which to site a groundwater pump-and-treat system for the PSA, pursuant to the requirements of the order (VWR 1993a).

On October 9, 1992, VWR signed a consent order (IDHW 1992c) with IDHW for investigation and remediation at the Boise Towne Square Mall, which includes the VWR site. The order states that VWR submitted a supplemental investigation and final remediation work plan that was approved



EXPLANATION

 Mall Investigation Area

 Affected Area

0 0.5
APPROXIMATE
SCALE IN MILES



FIGURE 3
VAN WATERS AND ROGERS, INC.
AFFECTED AREA BOUNDARY

Source: HLA 1993c.

PRC Environmental Management, Inc.

- perform interim source control activities (soil vapor extraction) for PCE compounds in the vicinity of the former VWR distribution facility
- evaluate existing site wells and abandon those which may transport PCE compounds and other contaminants from the surface to the subsurface or between hydrostratigraphic units
- assess the extent and migration pathway(s) of PCE compounds at the site in soil gas, soil, and groundwater, and if other source locations are identified, characterize the contamination at those source locations
- characterize the geology and hydrogeology of the site
- evaluate potential risks to human health and the environment at and immediately downgradient from the site that may be posed by the presence at the site of PCE compounds
- evaluate the need for, select, and implement remediation activities on the site, as appropriate, which could include groundwater treatment, or expansion of soil vapor extraction for final remediation

VWR is currently searching for available property to site a groundwater pump-and-treat system for the mall area (VWR 1993a).

HLA submitted a draft asymptotic protocol to IDEQ on June 17, 1993, which describes the statistical approach proposed for identifying and calculating when an asymptotic limit for regulated chemicals has been attained in groundwater during remediation at the Boise Towne Square Mall. IDEQ comments were sent to HLA on July 15, 1993. HLA's response to these comments was submitted on August 9, 1993. A final asymptotic protocol has not yet been submitted to IDEQ.

EPA representatives from the Superfund Response Investigations Section visited the site on June 11, 1992. A potential hazardous waste site identification form was completed based on a review of activities taking place at the site. The form indicates that groundwater downgradient of the VWR site is contaminated with PCE and that a trailer park drinking water well was affected, for which VWR had provided bottled water as an alternative supply (EPA 1992).

3.0 PATHWAYS AND ENVIRONMENTAL HAZARD ASSESSMENT

This section contains information about groundwater, surface water, soil exposure, and air contaminant migration pathways at the site.

The shallow geology in the site vicinity consists of 50 to 150 feet of unconsolidated silt, sand, and gravel of Pleistocene Age, referred to as older terrace gravels, which have been reworked and deposited by the Boise River. These older terrace gravels comprise the shallow aquifers in the area. Underlying the older terrace gravels and separated by an unconformity, is the Glenns Ferry Formation, which is late Pliocene to early Pleistocene Age and is composed of interbedded clay, silt, sand, fine gravel, and basalt up to 2,000 feet thick.

There is a shallow aquifer in the site vicinity at an approximate depth of 8 to 15 feet below ground surface (bgs). Localized groundwater recharge and discharge vary seasonally. Recharge generally occurs from the Ridenbaugh Canal, Farmers Lateral (south of the mall), and from local agricultural irrigation between April and October. However, localized groundwater discharge to the irrigation canals and sloughs has been observed in the area. Although the water table level and flow direction may fluctuate with the irrigation season, the predominant regional flow in this shallow aquifer is toward the northwest.

The deep aquifer system lies in the sand, gravel, and basalt of the Glenns Ferry Formation at approximately 50 to 150 feet bgs and has been reported as a confined aquifer. The deep aquifer is recharged primarily from infiltration of precipitation and snowfall along the foothills and ridge areas, and possibly from the shallow aquifer. Discharge from the aquifer is primarily from the Boise Water Corporation's production wells for domestic and industrial uses (HLA 1992a).

The presence of a continuous aquitard separating the shallow aquifer from the deeper Glenns Ferry aquifer system is unconfirmed for the west Boise area. Well logs for the area suggest that the aquitard is laterally discontinuous (HLA 1992a).

Groundwater is the source of drinking water for the 122,921 people who live within 4 miles of the VWR site. The shallow aquifer is used for most private drinking water supplies, while the deep aquifer is primarily used for public drinking water supplies. There are wells used for drinking water in both aquifers downgradient of the site as well as in the remaining 4-mile radius from the site. The nearest drinking water well that uses the shallow aquifer is approximately 0.45 mile from the VWR site, (b) (6)

The nearest drinking water well that uses the deep aquifer for supply is approximately 0.26 mile from the VWR site.

There is evidence of PCE-contaminated groundwater at the Boise Towne Square Mall, the Westpark Mall, and the affected area as described below.

Chen-Northern installed two observation wells immediately upgradient of the Boise Towne Square Mall property and two monitoring wells on the mall property (MW-1, MW-2, MW-3, and MW-4) for IDEQ in July 1991, to assess groundwater quality in the vicinity of the former VWR facility. GZA GeoEnvironmental, Inc. (GZA) completed an environmental site assessment of a portion of the Boise Towne Square Mall property in 1991. This portion is composed of the main mall building, parking areas, a detention pond, and three separate roadways that provide access to the site. GZA personnel installed six monitoring wells and collected samples from these wells and from two IDEQ wells (MW-1 and MW-2, at the former VWR site). PCE was detected in five of the eight monitoring wells sampled. PCE concentrations range from 56 to 2,500 $\mu\text{g/L}$, and indicate a northwest flow of contaminants. IDEQ indicated to GZA that no PCE was detected in observation wells installed upgradient of the mall property (GZA 1991).

Two monitoring wells were installed at the Boise Towne Square Mall in March and April 1993, by HLA for VWR. One well (MW-1) was north of the Olive Garden restaurant (see Figure 2) and one (MW-2) was approximately 76 feet northeast of IDEQ well MW-1. Grab groundwater samples were collected at 58 and 78 feet bgs from well boring MW-1, and at 58 and 98 feet bgs from well boring MW-2. PCE was detected at concentrations of 650 $\mu\text{g/L}$ and 1 $\mu\text{g/L}$ in the 58- and 78-foot bgs samples from well boring MW-1, respectively. PCE was also detected at a concentration of 2.1 $\mu\text{g/L}$ in the 58-foot bgs sample from well boring MW-2, but was not detected in the 98-foot bgs sample from well boring MW-2. PCE was also not detected in either groundwater sample collected from completed wells MW-1 or MW-2. HLA concluded that these results indicate that the PCE is limited to approximately the upper 70 feet of the shallow aquifer beneath the site. HLA submitted a draft monitoring well sampling and analysis plan to IDEQ in June 1993, which includes a site hydrogeologic characteristics investigation and an investigation to confirm that the vertical distribution of PCE at the VWR site is limited to the upper 70 feet of the shallow aquifer (HLA 1993).

SRM collects quarterly groundwater samples from 10 monitoring wells at the Westpark Mall. The analytical results for the quarterly samples collected on May 25, 1993, show that PCE concentrations range from 0.9 to 1,680 $\mu\text{g/L}$ in the groundwater beneath the Westpark Mall (SRM 1993). Quarterly sampling and groundwater remediation at the Westpark Mall area are ongoing.

Both the shallow and deep aquifers are contaminated with PCE in the affected area. PCE was detected in certain private wells downgradient (or northwest) of the VWR site during IDEQ's private well sampling in July 1988 and April 1989. In October 1990, IDEQ sampled 24 private wells northwest of the site; 15 contained PCE. Of these 15, PCE was detected in mostly shallow or unknown-depth domestic groundwater wells at concentrations ranging from 1.27 to 147 µg/L. PCE was also detected in two deep wells sampled October 1990 (134 µg/L, depth equal to 200 feet; 17.3 µg/L, depth equal to 300 feet) (HLA 1992b).

HLA collects quarterly samples of groundwater from private wells in the affected area. The most recent groundwater samples from private wells in the affected area were collected by HLA in August 1993. Two samples contained PCE at concentrations greater than the MCL of 5 µg/L; a sample from a well approximately 4,900 feet downgradient of the site contained 150 µg/L PCE, and a sample from a well approximately 8,900 feet downgradient of the site contained 5.1 µg/L PCE. Trichloroethene was detected in a sample from the well approximately 4,900 feet downgradient of the site at a concentration of 0.4 µg/L. Trichlorofluoromethane was detected in samples from two wells: one from a well approximately 2 miles downgradient of the site showed a concentration of 0.7 µg/L, and one from a well approximately 11,000 feet downgradient of the site showed a concentration of 0.9 µg/L.

HLA submitted a draft soil boring and well installation plan to IDEQ in July 1993, for the affected area. The soil boring will gather data to assist in the characterization of hydrogeologic conditions at the distal end of the affected area and provide information about the vertical distribution of PCE in the affected area. Two additional monitoring/extraction wells at the edge of the affected area and a monitoring well between the affected area and the Bali Hai well are also included in the plan. (The Bali Hai well is a deep aquifer Boise Water Corporation public water supply well at 10957 Tahiti Street [Boise Water Corporation 1993].) The monitoring well is to be installed to evaluate the effect that pumping of the Bali Hai well has on the shallow aquifer and to monitor deep domestic wells in the area (HLA 1993a).

3.2 SURFACE WATER

According to the U.S. Geological Survey topographic quadrangle map of the west Boise area, the VWR site, prior to development, sloped gently to the northwest. The nearest downgradient surface water is the South Slough, approximately 0.85 mile northwest of the site (USGS 1973). Overland migration of potentially contaminated surface water is no longer possible since the

contaminated soil is covered by the asphalt parking lot; however, South Slough is contaminated with PCE as discussed below.

According to representatives of the Nampa-Meridian Irrigation Corporation, which own the South Slough, the slough is not used as a drinking water source and is not a fishery. It is used for irrigation (Nampa-Meridian Irrigation Corporation 1993). There is an estimated 0.88 mile of wetland frontage along the slough (U.S. Department of the Interior 1993).

According to the GZA (1991) environmental assessment report, the asphalt-paved parking lots of the Boise Towne Square Mall have been sloped to divert storm water to a series of catch basins situated throughout the lots. Storm water from the catch basins is transported and discharged to the Ridenbaugh Canal, which flows northwesterly, just off the eastern portion of the mall property. There is storm water detention basin on the north-central portion of the property, which is designed to accept storm water from unusually heavy rains. There is a second detention basin northeast of the mall.

HLA and VWR sampled surface water and measured discharge of South Slough in the affected area on July 1, 1993. The discharge data indicate that the total discharge at each measurement station along the slough increased from the most upgradient station to the farthest downgradient station, thus indicating a gaining slough throughout the length measured. HLA concluded that the increased discharge along this length of the slough is likely the result of contributions from surface water bodies such as the Ridenbaugh Canal, other surface water sources along the South Slough, and groundwater discharge to the slough. The analytical results for the water samples collected indicate that PCE was detected in samples collected from every station at concentrations ranging from 1 to 4.8 $\mu\text{g/L}$. The highest concentration was detected in a sample collected directly downgradient of the South Slough intersection with the Ridenbaugh Canal (photograph 5). PCE concentrations generally decreased downgradient of this sample station, and no PCE was detected in the sample collected from the Ridenbaugh Canal. The sample collected from the station at the Westpark air stripper discharge point contained 1.5 $\mu\text{g/L}$ of PCE. A water sample collected from a groundwater seep at the intersection of South Slough and Emerald Street (photograph 6), contained 0.8 $\mu\text{g/L}$ of PCE. These findings are consistent with those for surface water samples collected from the South Slough by IDEQ in 1990, 1991, and 1992. HLA concluded that, based on the analytical results, it appears that water containing low levels of dissolved PCE is entering the South Slough via Westpark's air stripper discharge pipe and contaminated groundwater between the intersection of South Slough and Emerald Street (HLA 1993b).

3.3

SOIL

The contaminated soil at the site is inaccessible to the public because it is covered by asphalt. There are no residences within 200 feet of the PCE-contaminated soil, and it is estimated that no more than 25 people work at the Pier I Imports store located within the area of contaminated soil.

A shallow soil sample was obtained in the vicinity of the former PCE storage tank by IDEQ in April 1989, during construction of the Pier I Imports store. PCE was detected in the soil sample at 62 micrograms/kilogram ($\mu\text{g}/\text{kg}$) (GZA 1991).

In June 1989, VWR collected samples from soil borings drilled at the VWR site. Two of the soil borings B1 and B1A were drilled in the immediate vicinity of the former PCE storage tank; one (B2) was drilled approximately 30 feet southwest of the former tank. Organic contaminants detected in these borings are shown in Table 1.

TABLE 1
SOIL BORING ANALYTICAL DATA FOR JUNE 1989 (mg/kg)

Contaminant	B1-5	B1-8.5	B1-12	B1A-10.5	B2-5
Tetrachloroethene	17	1.4	0.74	0.16	1.1
1,2-Dichloroethene (total)	3.1	0.17	ND	ND	ND
Trichloroethene	1.7	0.17	0.05	ND	ND

ND Not detected

B1-5 Boring number-depth of sample (bgs)

Source: Vokey 1992.

Representatives of IDEQ, EPA, the City of Boise, Pier I Imports' consultant, and Boise Mall Development Company's consultant were present during a soil gas and groundwater field investigation conducted by HLA in September 1991. The investigation took place at the VWR site and in the immediate site vicinity. PCE was detected in 25 of the 34 soil gas samples at concentrations ranging from 0.11 to 5,500 $\mu\text{g}/\text{L}$; trichloroethene was detected in 18 samples at concentrations ranging from 0.03 to 1,800 $\mu\text{g}/\text{L}$; cis-1,2-dichloroethene was detected in 10 samples at concentrations ranging from 0.6 to 540 $\mu\text{g}/\text{L}$; trans-1,2-dichloroethene was detected in

two samples at concentrations ranging from 0.71 to 2.2 µg/L; and vinyl chloride was detected in two samples at concentrations ranging from 3.3 to 5.8 µg/L. Most of the soil gas samples were collected from 5 to 11 feet bgs. The highest concentrations of contaminants were detected at the location of the former PCE storage tank (HLA 1991b).

In October 1991, HLA drilled four soil borings at the VWR site and collected and analyzed soil samples from each. Two of these soil borings were drilled in the vicinity of the former PCE storage tank, one was drilled approximately 220 feet downgradient (west-northwest) of the former PCE storage tank location, and one was drilled at the southeast corner of the Pier I Imports building. The borings were drilled to approximately 1 foot below the water table at depths ranging from 13.5 to 14.5 feet; three soil samples from each boring were selected for analysis. The highest concentrations of VOCs were detected in samples collected from the borings drilled in the immediate vicinity of the former PCE storage tank. PCE was detected in all soil samples at concentrations ranging from 0.014 to 25,000 mg/kg. Trichloroethene was detected in samples from the borings in the immediate vicinity of the former tank location (0.4 to 3.1 mg/kg). Methylene chloride was detected in all but two samples (0.16 to 1.1 mg/kg). Carbon tetrachloride, cis-1,2-dichloroethene, and 1,1,1-trichloroethane were also detected in samples (HLA 1991a).

Contaminated soil mitigation at the VWR site includes a soil vapor extraction system as described in the following section.

3.4 AIR

The contaminated soil at the site is covered by an asphalt parking lot, so air migration of contaminated soil is unlikely.

In the January 1992, *Pilot Soil Vapor Extraction System Work Plan*, VWR proposed a soil vapor extraction pilot study in the area of the Pier I Imports store to mitigate the migration of contamination and to expedite installation of source control in soils that have been affected by VOCs. The pilot study uses vapor recovery and activated carbon units to recover VOCs from the subsurface. VOCs in the recovered air stream are removed by the activated carbon components of the system. The treatment system is housed in a self-contained, trailer-mounted, modular unit (photograph 7). The vapor recovery unit operates automatically 24 hours a day. Horizontal piping, placed in trenches (photographs 7, 8, and 9), and three vapor extraction wells (photographs

10, 11, 12, 13, 14) located in the zone of elevated VOCs in the subsurface soils are used to extract the VOCs (VWR 1992).

Daily soil vapor monitoring includes three vapor monitoring wells, and influent and effluent monitoring of the primary and secondary canisters of the treatment system. Soil vapor monitoring analytical data for April and May 1993, show that no organic vapors were detected past the influent to the primary canister of the treatment system. The highest concentration of organic vapor detected in the influent to the primary canister was 371 ppm on May 17, 1993. The soil vapor extraction system was shut down from May 1993 to September 1993, because a new spent carbon disposal facility needed to be identified; representatives of the disposal facility used prior to May informed VWR that it could no longer accept additional shipments of spent carbon (VWR 1993b; IDEQ 1993).

4.0 SUMMARY AND CONCLUSION

The VWR site is a former chemical product distribution facility. PCE was spilled here during distribution from an aboveground storage tank located outside the warehouse where VWR was operating from 1973 to 1981. Nielsen Transfer and Storage Company also occupied the warehouse during this time. In 1981, Nielsen Transfer and Storage Company was bought by AVNA, who occupied the property from 1981 to 1987. Nielsen Transfer and Storage Company maintained ownership of the building and property until April 1987, when the property and building were bought by the Boise Mall Development Company. Ownership of the land on which the former VWR site was located was transferred to Pier I Imports, Inc., in February 1989.

The warehouse and PCE tank are no longer on the site, but the PCE spills have contaminated the soil both on the site and in the vicinity. Based on analyses of groundwater and surface water samples, the shallow and deep aquifers are contaminated with PCE and PCE-breakdown compounds. The South Slough is also contaminated with PCE.

The primary threats to humans and the environment from the PCE-contaminated soil appear to be via groundwater migration to the shallow and deep aquifers, which are used for drinking water. There are three IDHW orders that include mitigation of the soil, groundwater, and surface water contamination at and downgradient of the former VWR site. An additional IDHW order with VWR includes providing alternative water supplies to those residences and businesses with PCE-contaminated well water downgradient of the site.

There are no direct soil or air exposure hazards at the site because the asphalt-paved parking lot covers the contaminated soil. The asphalt appeared to be in excellent condition during the August 27, 1993, preliminary assessment site inspection. With the asphalt in place, the contaminated soil is inaccessible to the public, infiltration of surface water through the contaminated soil is restricted, overland flow has no influence on the contaminated soil, and gas and particulate releases to air are unlikely.

Site contacts for the VWR site are:

Michael Gaudette, Site Representative
Van Waters and Rogers, Inc.
2723 S. Cole Road
Boise, Idaho 83709
(208) 362-6545

Rob Howarth
Idaho Division of Environmental Quality
1420 North Hilton
Boise, Idaho 83706-1260
(208) 334-0550

5.0 REFERENCES

Boise Water Corporation 1993. Letter from Camille Brown, Boise Water Corporation, to Crystal Bailey, PRC Environmental Management, Inc. October 20.

Color-Art, Inc. 1992. Boise, Idaho City Street Map.

EPA 1993a. Memorandum from Deborah Robinson, U.S. Environmental Protection Agency, to Crystal Bailey, PRC Environmental Management, Inc. November 29.

EPA 1993b. Geographic Information Systems Data for Van Waters and Rogers, Inc. site in Boise, Idaho. U.S. Environmental Protection Agency. October 18.

GZA 1991. Environmental Site Evaluation, Boise Towne Square, Boise, Idaho. GZA GeoEnvironmental, Inc. August.

HLA 1991a. Soil Boring Investigation, Former VWR Facility, Boise, Idaho. Prepared for Van Waters and Rogers, Inc., by Harding Lawson Associates. December 19.

HLA 1991b. Soil Gas and Groundwater Investigation, Former VWR Facility, Boise, Idaho. Harding Lawson Associates. October 25.

HLA 1992a. Exhibit #1 Work Plan, Preliminary Study Area Investigation, Boise, Idaho. Prepared for Van Waters and Rogers, Inc., by Harding Lawson Associates. September 8.

HLA 1992b. Work Plan, Boise Towne Square Mall Supplemental Investigation and Final Remediation, Boise, Idaho. Harding Lawson Associates. September 8.

HLA 1993a. Quarterly Progress Report, April through June 1993, Boise, Idaho. Harding Lawson Associates. June 22.

HLA 1993b. South Slough Seepage Study Sampling Letter from S. Michelle Beekman, Harding Lawson Associates, to Ron Lane, Idaho Division of Environmental Quality. August 3.

HLA 1993c. Letter from S. Michelle Beekman and Christopher R. Smith, Harding Lawson Associates, to Ron Lane, Idaho Division of Environmental Quality. April 26.

IDEQ 1993. Telephone Conversation between Rob Howarth, Idaho Division of Environmental Quality, and Crystal Bailey, PRC Environmental Management, Inc. October 22.

IDHW 1989. Westpark Partnership Consent Order. Idaho Code Section 39-108. Idaho Department of Health and Welfare. January 16.

IDHW 1992a. Preliminary Study Area Consent Order. Idaho Code Sections 39-4413 and 39-108. Idaho Department of Health and Welfare. October 9.

IDHW 1992b. Van Waters and Rogers, Inc. Consent Order. Idaho Code Sections 39-108 and 39-4413. Idaho Department of Health and Welfare. January 3.

IDHW 1992c. Boise Mall Consent Order. Idaho Code Sections 39-108 and 39-4413. Idaho Department of Health and Welfare. October 9.

- Nampa-Meridian Irrigation Company 1993. Telephone Conversation between Daren Coon, Nampa-Meridian Irrigation Company, and Crystal Bailey, PRC Environmental Management, Inc.. September 30.
- PRC 1993. Record of Telephone Conversation Regarding Use of Warehouse by Air Van North American. Between Crystal Bailey, PRC Environmental Management, Inc., and Don Stillwaugh, Air Van North American. November 30.
- SRM 1987. Environmental Assessment for the Proposed Westpark Commercial Center, Boise, Idaho. Prepared for Pacific Rim Development Corporation by Special Resource Management, Inc. November 6.
- SRM 1989. Groundwater Remedial Action Plan for the Westpark Commercial Center, Boise, Idaho. Prepared for the Westpark Partnership by Special Resource Management, Inc. January 13.
- SRM 1993. May 1993 Analytical Results for Quarterly Groundwater Sampling at Westpark. Special Resource Management, Inc. June 21.
- U.S. Department of the Interior 1993. Letter with National Wetland Inventory Maps enclosed, from Charles H. Lobdell, U.S. Department of the Interior, to Tom Slocum, PRC Environmental Management, Inc.. September 9.
- U.S.G.S. 1973. Cloverdale Quadrangle Map. U.S. Geological Survey. 1953, photo revised 1973.
- Vokey, S.R. 1992. Letter from Scott R. Vokey, Preston, Thorgrimson, Shidler, Gates, and Ellis, to Douglas Conde, Idaho Division of Environmental Quality. March 28.
- VWR 1992. Pilot Soil Vapor Extraction System Work Plan, Boise, Idaho. Prepared by Van Waters and Rogers, Inc. January 24.
- VWR 1993a. Letter from Michael Gaudette, Van Waters and Rogers, Inc., to Ron Lane, Idaho Division of Environmental Quality. August 2.
- VWR 1993b. Letter from Michael Gaudette, Van Waters and Rogers, Inc., to Carleton Wold, Idaho Division of Environmental Quality. July 28.

APPENDIX A
PHOTOGRAPH LOG

APPENDIX A
PHOTOGRAPH LOG



Photograph: 1	Date: August 27, 1993	Taken By: C. Bailey	Direction Facing: West
Site Name: Van Waters and Rogers, Inc.		EPA ID No: IDD984670067	
Description: Foreground of photograph shows the location of the former aboveground PCE storage tank. The Pier I imports store is in the background, in the approximate location of the former warehouse.			



Photograph: 2
Date: August 27, 1993
Taken By: C. Bailey
Direction Facing: North
Site Name: Van Waters and Rogers, Inc.
EPA ID No: IDD984670067
Description: Foreground of photograph shows the location of the former aboveground PCE storage tank. The Bon Marche department store is approximately 550 feet north of the VWR site, in the Boise Towne Square Mall.

(b) (6)



(b) (6)



Photograph: 6

Date: August 27, 1993

Taken By: C. Bailey

Direction Facing: South

Site Name: Van Waters and Rogers, Inc.

EPA ID No: IDD984670067

Description: South Slough at the intersection with Emerald Street. This is the location of the known groundwater seep to the slough, which is contaminated with PCE.





Photograph: 7	Date: August 27, 1993	Taken By: C. Bailey	Direction Facing: West
Site Name: Van Waters and Rogers, Inc.		EPA ID No: IDD984670067	
Description: Darker section of asphalt is where the pipe for the soil vapor extraction system was laid. The trailer houses the treatment portion of the extraction system.			



Photograph: 8
Date: August 27, 1993
Taken By: C. Bailey
Direction Facing: Northwest
Site Name: Van Waters and Rogers, Inc.
EPA ID No: IDD984670067
Description: The darker, cut section of the asphalt is where the soil vapor extraction system piping was laid. Foreground shows valve access cover to trench.



Photograph: 9	Date: August 27, 1993	Taken By: C. Bailey	Direction Facing: South
Site Name: Van Waters and Rogers, Inc.		EPA ID No: IDD984670067	
Description: The darker, cut section of asphalt is where the soil vapor extraction system piping was laid. At center-left, one of the three vapor extraction wells is shown.			



Photograph: 10	Date: August 27, 1993	Taken By: C. Bailey	Direction Facing: South
Site Name: Van Waters and Rogers, Inc.		EPA ID No: IDD984670067	
Description: The darker, cut section of asphalt is the location of the soil vapor extraction system trench. Two of the soil vapor extraction wells are shown in the center.			



Photograph: 11	Date: August 27, 1993	Taken By: C. Bailey	Direction Facing: Southeast
Site Name: Van Waters and Rogers, Inc.		EPA ID No: IDD984670067	
Description: Soil vapor extraction trench is shown at right. The two easternmost soil vapor extraction wells are in the center. Cars in photograph are on Franklin Road; bridge is Interstate 184.			



Photograph: 12	Date: August 27, 1993	Taken By: C. Bailey
Site Name: Van Waters and Rogers, Inc.		EPA ID No: IDD984670067
Description: The westernmost soil vapor extraction well. The concrete has a good seal with the asphalt so no soil is exposed and no surface water can seep into soil.		



Photograph: 13	Date: August 27, 1993	Taken By: C. Bailey
Site Name: Van Waters and Rogers, Inc.		EPA ID No: IDD984670067
Description: The center soil vapor extraction well. The concrete has a good seal with the asphalt so no soil is exposed and no surface water can seep into soil.		



Photograph: 14	Date: August 27, 1993	Taken By: C. Bailey
Site Name: Van Waters and Rogers, Inc.		EPA ID No: IDD984670067
Description: The easternmost soil vapor extraction well. The concrete has a good seal with the asphalt so no soil is exposed and no surface water can seep into soil.		

CERCLA ELIGIBILITY CHECKLIST

(Check all that apply)

SITE NAME: Van, Waters and Rogers, Inc.DATE: 8/10/93

- Petroleum exclusion
_____ exempt wastes present
- NRC
_____ a federally licensed facility
- Pesticide site
_____ legal application of pesticides in vicinity
- Indoor air pollutants
_____ present
- Federally permitted release
_____ present (specify -)
- Mining site
_____ excluded waste (see 54 FR 15316)
- Aggregation issues
_____ groundwater plumes - likely sources identified
_____ sediment contamination
_____ non-contiguous areas of concern
_____ other (specify -)
- RCRA
_____ protective filer
_____ non-notifier
_____ convertor
☒ generator or transporter, *spent carbon cartridges*
_____ late filer
_____ permit issued before HSWA (1984)
_____ owner bankrupt
_____ unwilling (see 53 FR 30005)
_____ inability to pay (see 53 FR 30002)
_____ TSD (give status and dates)

_____ None apply